REMARKS

Claims 1 to 31 were presented for examination in the present application. The instant amendment adds new claims 32 to 38. Thus, claims 1 to 38 are presented for consideration upon entry of the instant amendment.

Applicants thank the Examiner for his close attention to detail in reviewing the present application.

The specification has been amended in the manner suggested by the Examiner. Specifically, the paragraph beginning at page 21, line 23 has been amended to change "23a" to "22a". Similarly, the paragraph beginning at page 23, line 10 has been amended to change "24a" to "23a and 24a". The paragraph beginning at page 26, line 10 has been amended to include the element "opening 107" as illustrated in Fig. 9. In addition, the paragraphs beginning at page 21, line 23 and page 26, line 10 have been amended to correct obvious grammatical errors.

Formal drawings will be submitted upon approval of the amendment proposed herewith.

The outstanding Office Action objected to claims 1, 5 to 7, 10, 16, 26 to 29, and 31. In addition, the outstanding Office Action rejected claims 1, 6, 10, 13, 14, 18, 21, 26, 28, and 31 under 35 U.S.C. §112, second paragraph.

The instant amendment amends claims 1, 5 to 7, 10, 13, 14, 16, 18, 22, 26 to 29, and 31.

Specifically, claim 1 has been amended to change "the" to

"a" for the "measurement surface", "measurement sequence", "measurement results", and "spectral characteristic" elements. Claim 1 has also been amended to remove the objected "preferably" language.

In addition, claim 1 has been amended to remove the article "a" and "an" from the "first optical means", "second optical means", "control and evaluation means", and "output display means", respectively.

Claim 1 has been amended to positively recite that "said at least one illuminating means emitting an emitted light at a predetermined angle" and to positively recite that "said second optical means for receiving a reflected light". In addition, claim 1 has been amended to positively recite that "said second optical means has at least one photo sensor for emitting an electrical measurement signal" and that "said control and evaluation means having at least one processor device and at least one memory means".

Also, "said illuminating means" has been changed to "said at least one illuminating means", "said light emitted" has been changed to "said emitted light", "said surface" has been changed to "said measurement surface", "said evaluation means" has been changed to "said control and evaluation means", "the incident light" has been changed to "the emitted light and/or the reflected light", "said light source" has been changed to "said at least one light source", and "said photo sensor" has been changed to "said at least one photo sensor" to properly refer back to the earlier introduced elements.

Claim 5 has been amended to depend from claim 1. In

addition, claim 5 has been amended to change "the" to "a" for the "typical wavelength" and "topology" elements. Claim 5 has also been amended to change "said at least one parameter" to "said at least one parameter" to properly refer back to the earlier introduced element.

Claim 6 has been amended to change "the" to "a" for the "C light type standard", "D65 light type standard", and "A light type standard" elements. In addition, claim 6 has been amended to remove the "or other similar light type standards" limitation and to place the claim in proper Markush format.

Claim 7 has been amended to change "the" to "an" and "a" for the "aggregate", "spectral sensitivity", "sensitivity", and "human eye" elements, respectively. Also, claim 7 has been amended to change "the sensor" to "the at least one photo sensor" and to change "the light emitted onto the measurement surface" to "the emitted light" to properly refer back to the earlier introduced elements.

Claim 10 has been amended to recite that the illuminating means "further comprises at least a second light source".

Claim 13 has been amended to delete the "whereby said light pattern preferably comprises at least one light/dark edge" limitation. In addition, claim 13 has been amended to change "said light emitted from said first optical means" to "said emitted light" to properly refer back to the earlier introduced element.

Claim 14 has been amended to delete the "preferably at least one section of said plurality of light/dark edges is of a

form taken from a group of forms encompassing grid, cross-mesh, ellipse, circular and the like" limitation.

Claim 16 has been amended to change "the" to "a" for the "gradient" element. Claim 16 has also been amended to change "said measurement" to "said measurement surface" and to change "said evaluation means" to "said control and evaluation means" for purposes of antecedent basis.

Claim 18 has been amended to delete the "in particular" and "said predetermined angles preferably differ between the different optical means" limitations and to place the claim in proper Markush format. In addition, claim 18 has been amended to change "said light" to "said emitted light" and "said optical means" to "said first optical means" to properly refer back to the earlier introduced elements.

Similarly, claim 22 has been amended to delete the "preferably three or more" limitation and to positively recite that "said at least two photo sensitive elements having electrical output signals that can be ascertained individually and that differ in their spectral characteristics".

Claim 26 has been amended to further comprise at least one temperature measuring means for determining a characteristic temperature of said first and second optical means so that a temperature-corrected determination of at least one parameter can be made.

Claim 27 has been amended to change "the" to "a" or "an" for the "progression", "image", "measured path", and "ideal

path" elements, respectively.

Claim 28 has been amended to change "an essentially constant spacing" to "a constant spacing". Claim 28 has also been amended to positively recite that "the device further comprises a distance measuring means that quantitatively ascertains a relative movement and a memory means for storing the structural and/or optical parameters measured along predetermined measurement points on said measurement surface".

Claim 29 has been amended to recite that "said at least one measurement wheel is positioned upon said measurement surface during measurement and rotates during said relative movement".

Claim 31 has been amended to change "the" to "an" or "a" for the "emitted light", "measurement sequence", and "measurement results" elements, respectively. Claim 31 has also been amended to remove the article "a" and "an" from the "first optical means", "second optical means", "control and evaluation means", and "output display means", respectively.

In addition, claim 31 has been amended to remove the objected "preferably" language. Claim 31 has also been amended to change both the "light reflected" and the "received light" to the previously introduced "reflected light" element. Further, claim 31 has been amended to positively recite that "said control and evaluation means having at least one processor device and stores said measurement signal in a memory means"

It is respectfully submitted that these amendments merely make explicit what had been implicit in the claims. Accordingly, reconsideration and withdrawal of the rejections

under 35 U.S.C. §112, second paragraph are respectfully requested.

Claims 1 to 5, 8, 11 to 17, 22, and 28 were rejected by the outstanding Office Action under 35 U.S.C. §103(a) over U.S. Patent No. 5,880,826 to Jung et al. (Jung) in view of U.S. Patent No. 6,241,672 to Hochman et al. (Hochman).

It is respectfully submitted that the proposed combination does not disclose or suggest claim 1. Claim 1 now requires, among other elements, that the wavelength-dependent spectral intensity of the light diode is in the wavelength range between 480 and 620 nm. Support for this amendment can be found in the specification at least at page 6, line 23 through page 7, line 2.

Jung is directed to a measurement system for the optical characteristics of teeth. Here, an optical fiber illuminates the measurement surfaces. The light reflected from the teeth is received by an optical fiber, which passes the light on to a receiver for evaluation. However, Jung is silent about the claimed distribution of light with respect to the wavelength.

Rather, Jung provides that the light source is a halogen light source. See Col. 8, lines 21-24. In contrast, claim 1 requires the light source to be a light diode (e.g., a LED source).

Hochman is directed to a method for detection of the presence of solid tumor tissue that uses a cutoff filter to excludes all wavelengths below about 695 nm. Thus, Hochman is directed to light sources above the visible spectrum (i.e., 400-

700 nm) in the near infrared region.

Accordingly, Jung is silent as to the distribution of light with respect to the wavelength. Further, Hochman is directed to a system that blocks the whole visible spectrum using a cutoff filter. In contrast, claim 1 now requires the use of the whole visible spectrum (e.g., wavelength range between 480 and 620 nm) to illuminate the surface to be measured.

Moreover, it is submitted that one skilled in the art would not use an light emitting light source in the claimed spectrum, when it is desired to illuminate a surface with the whole visible spectrum. Therefore, it is submitted that the proposed combination teaches away from amended claim 1.

It is therefore submitted that the proposed combination does not disclose or suggest amended claim 1. For at least the reasons set forth above, claim 1 is in condition for allowance. Since claims 2 to 5, 8, 11 to 17, 22, and 28 depend from claim 1, they are also believed to be in condition for allowance.

Claims 6, 7, 9, 10, 18, 19 to 21, and 23 to 27 also all depend from claim 1.

Claim 6 was rejected under 35 U.S.C. §103(a) over Jung in view of Hochman and in further view of U.S. Patent No. 4,150,898 to Suga (Suga). Claim 7 was rejected under 35 U.S.C. §103(a) over Jung in view of Hochman and in further view of U.S. Patent No. 6,407,830 to Keithley et al. (Keithley). Claim 9 was rejected under 35 U.S.C. §103(a) over Jung in view of Hochman and in further view of U.S. Patent No. 6,262,845 to Sweatt (Sweatt). Claim 10 was rejected under 35 U.S.C. §103(a) over

Jung in view of Hochman and in further view of U.S. Patent No. 5,795,798 to Mishra et al. (Mishra). Claims 18 and 19 were rejected under 35 U.S.C. §103(a) over Jung in view of Hochman and in further view of U.S. Patent No. 5,392,125 to Reisser (Reisser). Claims 20, 21, 23, and 24 were rejected under 35 U.S.C. §103(a) over Jung in view of Hochman and Reiser and in further view of U.S. Patent No. 5,923,434 to Lex (Lex). Claims 25 to 27 were rejected under 35 U.S.C. §103(a) over Jung in view of Hochman, Reiser, Lex, and in further view of U.S. Patent No. 4,918,321 to Klenk et al. (Klenk).

The Jung, Suga, Keithley, Sweatt, Mishra, Reisser, Lex, and Klenk references are each all silent to the wavelength. Further, Hochman is directed to a system that blocks the whole visible spectrum using a cutoff filter. However as set forth in detail above, claim 1 requires the use of the whole visible spectrum (e.g., wavelength range between 480 and 620 nm) to illuminate the surface to be measured.

Since none of the proposed combinations alone or in combination disclose or suggest the wavelength claimed by independent claim 1, claims 6, 7, 9, 10, 18, 19 to 21, and 23 to 27 are also believed to be in condition for allowance.

Similar to claim 1 discussed above, claim 31 was rejected by the outstanding Office Action under 35 U.S.C. §103(a) over Jung in view of Hochman.

It is also respectfully submitted that the proposed combination does not disclose or suggest claim 31. Claim 31, similar to claim 1 discussed above, now requires, among other elements, that the light diode has a wavelength-dependent

spectral intensity in the wavelength range between 480 and 620 nm and is greater than one-hundredth of the maximum spectral intensity. Support for this amendment can be found in the specification at least at page 6, line 23 through page 7, line 2.

Again, Jung is silent as to the distribution of light with respect to the wavelength, while Hochman blocks the whole visible spectrum. In contrast, claim 31 requires the use of the whole visible spectrum (e.g., wavelength range between 480 and 620 nm) to illuminate the surface to be measured. Thus, claim 31 is also in condition for allowance.

Claims 32-38 have been added to depend from claim 1 and to particularly point out various aspects of the present application. Support for new claims 32 and 32 can be found at least in original claim 10. Support for new claims 34-37 can be found at least in original claims 13, 14, 18, and 22, respectively. Support for new claim 38 can be found in the specification at least at page 6, lines 19-28.

Claims 32-38 are also believed to be in condition for allowance, for example, for the reasons discussed above with respect to claim 1.

Attached hereto is a marked-up version of the claims. The attached page is captioned "Marked Up Version to Show Changes Made".

In view of the foregoing, it is respectfully submitted that the present application is in condition for allowance. Such action is most earnestly solicited.

If for any reason the Examiner feels that consultation with applicants' attorney would be helpful in the advancement of the prosecution, he is invited to call applicant's attorney at the telephone number below.

Respectfully submitted,

Date: April 17, 2003

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VERSION WITH MARKING TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please amend the paragraph at page 21, line 23 as follows:

The spectral path 22 of transmission filter 9 of first optical means 2 shown in Fig. 3 has a maximum transmission at about 550 nm; [at shorter wavelengths,] the transmission rate of filter 9 reduces at shorter wavelengths. Measurement points [23a] 22a of spectral transmission 22 are likewise plotted in Fig. 3 at an interval of about 10 nm.

Please amend the paragraph at page 23, line 10 as follows:

The complete device properties together yield a spectral path 24, represented in Fig. 5. In comparison, the ideal spectrum 23 is plotted in Fig. 5 whereby individual measurement points 23a and 24a of the actual and the ideal spectra are additionally indicated. In the region shown, the variations between the actual and the ideal spectra are small, so that a good correlation with the measurement conditions prescribed in ISO 2812 may be assumed.

Please amend the paragraph at page 26, line 10 as follows:

The measuring device depicted in Fig. 9 has a housing 100 comprising the measuring optics and an opening 107. As in the previous embodiments, a first optical system encompasses a first optical means 2 and a second optical means 10, their optical axes each being aligned at angles 17, 18, respectively, to the standard of measurement surface 108.

IN THE CLAIMS:

Please amend claims 1, 5 to 7, 10, 13, 14, 16, 18, 22, 26 to 29, and 31 as follows:

1. (Twice amended) A device for making quantified determinations of the quality of surfaces, having an optical system, comprising:

[a] first optical means having at least one illuminating means, [the] said at least one illuminating means emitting an emitted light [of which is directed] at a predetermined angle to a [the] measurement surface[, which is a part of the surface to be measured],

[a] second optical means being aligned at a predetermined angle to said measurement surface [and which receives the light] , said second optical means for receiving a reflected light from said measurement surface, whereby said second optical means [comprises] has at least one photo sensor[, which emits] for emitting an electrical measurement signal that is characteristic of the reflected light,

[a] control and evaluation means [provided] for [the] controlling [of] a [the] measurement sequence and for [the] evaluating [of the] a measurement results [and which has] said control and evaluation means having at least one processor device and at least one memory means,

[an] output display means,

whereby said at least one illuminating means [comprises] has at least one light source, [which] wherein said at least one light source is a light diode,

whereby [said] emitted light [emitted] from said illuminating means is configured [in such a manner that] to provide a [the] spectral characteristic [comprises preferably] having at least blue, green and red spectral components,

[whereby] a filter means [is] being arranged [in the path of radiation] between said at least one light source and said at least one photo sensor [so as] to change the spectral characteristic of the [incident] emitted light and/or the reflected light [in such a way] in accordance with predetermined filter properties so that the spectral characteristic essentially approaches that of a predetermined spectral distribution, [and]

whereby said control and evaluation means evaluates said reflected light and derives at least one parameter variable therefrom [which] that is characteristic of said measurement surface, and

whereby the light diode has a wavelength-dependent spectral intensity that is in the wavelength range between 480 and 620 nm and is greater than one-hundredth of the maximum spectral intensity.

5. (Twice amended) The device according to claim 1 [5], wherein said [characteristic optical] at least one parameter is a representative measurement of a [the] typical wavelength and amplitude of a [the] topology of [the] said measurement surface

in a predetermined wavelength interval, whereby said evaluation may also be carried out in two or more wavelength bands.

6. (Twice amended) The device according to claim 5, wherein said predetermined spectral distribution is a standard distribution having a light type taken from [among one of] the standard light type groups [encompassed by] selected from the group consisting of a [the] C light type standard, a [the] D65 light type standard, and an [the] A light type standard [or other similar light type standards].

7. (Twice amended) The device according to claim 1, wherein a spectral measurement characteristic is an [the] aggregate of the spectral characteristic of the emitted light [emitted onto the measurement surface] and a [the] spectral sensitivity of the at least one photo sensor in proportion to an aggregate of a spectral distribution of a light type standard and a [the] sensitivity of a [the] human eye.

10. (Twice amended) The device according to claim 1, wherein said illuminating means further comprises at least a second light source [or several light sources preferably configured as light diodes, whereby preferably each of said light sources has a differing spectral characteristic].

13. (Twice amended) The device according to claim 1, wherein at least a first part of said emitted light [emitted from said first optical means] exhibits a light pattern [, whereby said light pattern preferably comprises at least one light/dark edge].

14. (Twice amended) The device according to claim 1,

further comprising a plurality of light/dark edges [of which] with at least one part thereof [extends] extending at least sectionally parallel to one another [and that preferably at least one section of said plurality of light/dark edges is of a form taken from a group of forms encompassing grid, cross-mesh, ellipse, circular and the like].

16. (Twice amended) The device according to claim 1, wherein said control and evaluation means is so configured that at least one average parameter for at least a portion of a [the] gradient can be determined and a characteristic structural variable can be determined for a structure-contingent property of said measurement surface therefrom.

18. (Twice amended) The device according to claim 17, wherein said predetermined angle, at which said emitted light [emitted] from said at least one of said first optical means is directed to [the] said measurement surface, is an angle selected from [among a] the group of angles [which include , in particular, the angles] consisting of 0°, 10°, 15°, 20°, 30°, 45°, 60°, 75°, 80° and 85° [, and whereby said predetermined angles preferably differ between the different optical means].

22. (Twice amended) The device according to claim 1, wherein at least one photo sensor has at least two [, preferably three or more,] photo sensitive elements, said at least two photo sensitive elements having [the] electrical output signals [of which] that can be ascertained individually and [which] that differ in their spectral characteristics, so that the color of said reflected light can be ascertained as an optical parameter of said measurement surface.

26. (Twice amended) The device according to claim 25, [wherein] further comprising at least one temperature measuring means [is arranged as close as possible to at least one light source and/or at least one photo sensor, provided] for determining a [the] characteristic temperature of each [respective light source or respective photo sensor for the purpose of enabling] of said first and second optical means so that a temperature-corrected determination of at least one parameter can be made.

27. (Twice amended) The device according to claim 26, wherein at least a portion of a [the] progression of an [the] image of said at least one light/dark edge is defined on said plurality of photo sensors and a characteristic surface parameter of said measurement surface is determined from a deviation of a [the] measured path from an [the] ideal path.

28. (Twice amended) The device according to claim 1, wherein [said] the device is moveable relative to [the] said measurement surface at a [an essentially] constant spacing therefrom, wherein the device further comprises [and] a distance measuring means [is provided which] that quantitatively ascertains [said] a relative movement and [that] a memory means [is furthermore provided into which] for storing the structural and/or optical parameters measured along [the] predetermined measurement points on [the] said measurement surface [are stored].

29. (Twice amended) The device according to claim 28, [wherein] further comprising at least one measurement wheel, wherein said at least one measurement wheel is [provided which positions] positioned upon [the] said measurement surface during

[the] measurement and [which] rotates during [the] said relative movement [between said device and said measurement surface].

31. (Twice amended) A method for making quantified determinations of the quality of surfaces, said method comprising:

providing [a] first optical means having a first light source disposed as a light diode [in order] to direct an [the] emitted light with [preferably] blue, green and red spectral components at a predetermined angle onto a measurement surface;

providing [a] second optical means [comprising] having at least one photo sensor directed at a second predetermined angle to said measurement surface [in order] to receive [the] a reflected light [reflected] from said measurement surface, whereby said at least one photo sensor emits an electrical measurement signal [which] that is characteristic of the [received] reflected light;

providing [a] control and evaluation means for controlling a [the] measurement sequence and evaluating a [the] measurement results, said control and evaluation means having [and which has] at least one processor device and [which] stores said measurement signal in a memory means;

providing an output display means for displaying said measurement results; and

evaluating said reflected light and deriving at least one parameter variable therefrom [which] that is characteristic of said measurement surface,

whereby the light diode has a wavelength-dependent spectral intensity in the wavelength range between 480 and 620 nm and is greater than one-hundredth of the maximum spectral intensity.